7.1 – Developing Systems of Linear Equations Review (see p. 397; complete on lined paper)

For the word problems in #1-10:

a) create a linear system to model the given situation
b) verify the given solution in both equations of your linear system

1. Tickets are sold for the school play. Felix buys 3 adult tickets and 2 student tickets. He pays $31. Ellen buys 1 adult ticket and 1 student ticket. She pays $12.
   Solution: adult tickets: 7
   student ticket: 5

   $3a + 2T = 31$ $A + T = 12$ $3(7)+2(5)=21+10=31$ $7+5=12$

2. Eight-passenger vans and six-passenger vans carried 110 people. There were 15 vans in total.
   Solution: eight-passenger vans: 10
   six-passenger vans: 5

   $E + P = 15$ $8E + 6P = 110$ $10+5=15$ $8(10)+6(5)=80+30=110$

3. A gardener bought carrot seeds for $2 a packet and squash seeds for $5 a packet. He spent $38 and bought 13 packets of seeds.
   Solution: carrot seed packets: 9
   squash seed packets: 4

   $C + Q = 13$ $2C + 5Q = 38$ $9+4=13$ $2(9)+5(4)=18+20=38$

4. A school sold 175 smoothies to raise money for charity. A banana smoothie cost $3 and a peach mango smoothie cost $5. The school raised $625.
   Solution: banana smoothies: 125
   peach mango smoothies: 50

   $B + P = 175$ $3B + 5P = 625$ $125+50=75$ $3(125)+5(50)$ $375+250=625$

5. One afternoon, the Winnipeg Art Gallery sold 300 adult and student tickets. An adult ticket cost $8 and a student ticket cost $6. The total money collected was $2000.
   Solution: adult tickets: 100
   student tickets: 200

   $A + T = 300$ $8A + 6T = 2000$ $100+200=300$ $8(100)+6(200)$ $=800+1200$ $=2000$

6. The total number of wheels on the bicycles and tricycles in a store is 45. There are 10 more bicycles than tricycles.
   Solution: bicycles: 15
   tricycles: 5

   $2B + 3T = 45$ $T + 10 = B$ $2(15)+3(5)=30+15=45$ $5+10=15$

7. Dalton has $5 and $10 bills in his wallet. He has 12 bills in total with a value of $75.
   Solution: $5: 9
   $10: 3

   $F + T = 12$ $5F + 10T = 75$ $9+3=12$ $5(9)+10(3)=45+30=75$

8. Julie bought 8 books. Some books cost $13 each and the rest cost $24 each. She spent a total of $137.
   Solution: $13 books: 5
   $24 books: 3

   $H + W = 8$ $13H + 24W = 137$ $5+3=8$ $13(5)+24(3)$ $=65+72$ $=137$

9. A test has twenty questions worth 100 points. There are short answer questions worth 3 points each and long answer questions worth 11 points each.
   Solution: short answer questions: 15
   long answer questions: 5

   $T + L = 20$ $3T + 11L = 100$ $15+5=20$ $3(15)+11(5)$ $=45+55$ $=100$

10. The cost of a buffet dinner for a family of six was $48.50. The prices were $11.75 per adult and $6.25 per child.

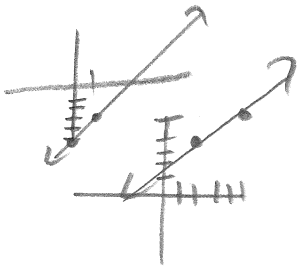
Solution: adults: 2
children: 4

$11.75A + 6.25C = 48.50$

$A + C = 6$

review of ch 5, 6:

11. Graph using the slope-intercept method: $y = 2x - 5$



12. Graph using the slope-point method: $y + 4 = \frac{1}{3}(x - 2)$

point $(2, -4)$ $m \frac{1}{3}$

13. Graph using the intercepts:

a) $5x - 2y = 10$ $-2y = 10$, $y = -5$; $5x = 10$, $x = 2$

b) $3x + 5y + 15 = 0$ $5y + 15 = 0$, $y = -3$; $3x + 15 = 0$, $x = -5$

c) $\frac{1}{2}x + y = 3$

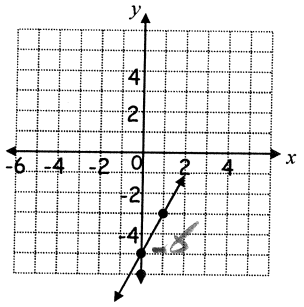
14. Find the equation of the line passing through (0, -3) with a slope of 5. Express your answer in slope-intercept form. $y + 3 = 5(x - 0)$, $y + 3 = 5x$, $y = 5x - 3$

15. Find the equation of the line passing through (-1, 4) and (2, -5). Express your answer in slope-point form. $m = \frac{4 + 5}{-1 - 2} = \frac{9}{-3} = -3$

Answers:

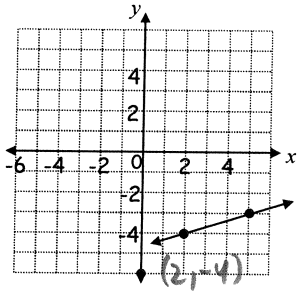
1 - 10. student work and verifying

11.



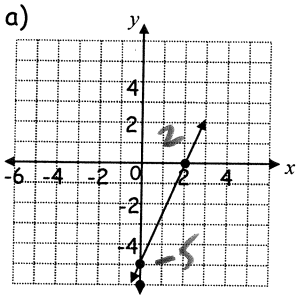
$m = 2$

12.

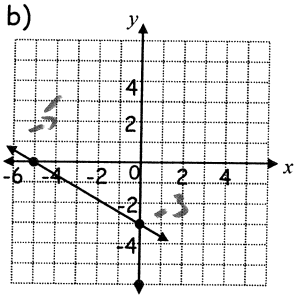


$m = \frac{1}{3}$

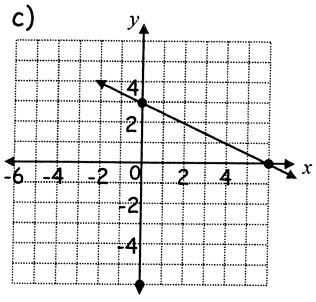
13. a)



b)



c)



14. $y = 5x - 3$

15. $y - 4 = -3(x + 1)$ or $y + 5 = -3(x - 2)$

7.2 – Solving a System of Linear Equations Graphically Review (see p. 405)

For the graphing questions #1-10:

a) solve the given system by graphing (graph paper)
b) verify your solution in both equations of the linear system

1. $x+y=4 \Rightarrow y=-x+4$
   $2x+y=6 \Rightarrow y=-2x+6$

2. $x+y=3 \Rightarrow y=-x+3$
   $2x+y=5 \Rightarrow y=-2x+5$

Graph using intercepts (x=0 to find y-intercept; y=0 to find x-intercept) or convert to y=mx+b

3. $2x-y=-4 \Rightarrow y=2x-4$
   $3x+y=-1 \Rightarrow y=-3x-1$

4. $2x+y=3 \Rightarrow y=-2x+3$
   $-x+y=-9 \Rightarrow y=x-9$

5. $x-y=5 \Rightarrow y=x-5$
   $3x+2y=10 \Rightarrow y=-\frac{3}{2}x+5$

6. $x-y=3 \Rightarrow y=x-3$
   $4x+5y=30$
   $y=-\frac{4}{5}x+6$

7. $\frac{1}{2}x+y=3 \Rightarrow y=-\frac{1}{2}x+3$
   $x+y=5 \Rightarrow y=-x+5$

8. $\frac{1}{3}x-y=1 \Rightarrow y=\frac{1}{3}x-1$
   $x-2y=4 \Rightarrow y=\frac{1}{2}x-2$

9. $x+y=9 \Rightarrow y=-x+9$
   $4x+12y=60 \Rightarrow y=-\frac{1}{3}x+5$

10. $x+y=7 \Rightarrow y=x+7$
    $3x+12y=48 \Rightarrow y=-\frac{1}{4}x+4$

Chapter 5, 6, 3 review (lined paper)

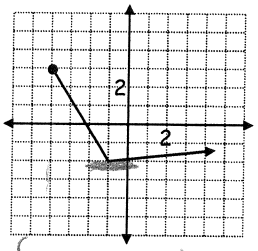
11. Find the equation of the line parallel to $y=\frac{1}{2}(x+7)$ passing through (3, -6). Express your answer in general form. ($m_1=\frac{1}{2}$, so $m_2=\frac{1}{2}$) $y+6=\frac{1}{2}(x-3) \Rightarrow 2y+12=x-3 \Rightarrow x-2y-15=0$

12. Find the distance between A(-5, 1) and B(3, 5). Express your answer as a reduced radical. (mixed)
$d=\sqrt{(-5-3)^2+(1-5)^2}=\sqrt{(-8)^2+(-4)^2}=\sqrt{64+16}=\sqrt{80}=4\sqrt{5}$

13. Line CD with endpoints C(-12, 7) and D has midpoint M(-1, 8). Find the coordinates of point D.
$-1=\frac{-12+x}{2} \Rightarrow -2=-12+x \Rightarrow 10=x$; $8=\frac{y+7}{2} \Rightarrow 16=y+7 \Rightarrow 9=y$ (10, 9)

14. Factor.
   a) $3m^2+3m^2n+3m$ $3m(m+mn+1)$
   b) $x^2+2x-15$ $(x+5)(x-3)$
   c) $2x^2-5x-12$ $(2x+3)(x-4)$
   d) $2m^2-18$ $2(m^2-9)=2(m-3)(m+3)$

15. State the domain and range for the following relation:



y goes up indefinitely.

{x ≥ -4} or [-4, ∞) (y ≥ -2) [-2, ∞)

Answers: 1.(2, 2) 2. (2, 1) 3. (-1, 2) 4. (4, -5) 5. (4, -1) 6. (5, 2) 7. (4, 1 8. (6, 1) 9. (6, 3) 10. (4, 3) 11. $x-2y-15=0$ 12. $4\sqrt{5}$ 13. D(10, 9) 14. a) $3m(m+mn+1)$ b) $(x+5)(x-3)$ c) $(2x+3)(x-4)$ d) $2(m+3)(m-3)$ 15. Domain: { x | x ≥ -4 } or $[-4,\infty)$ Range: { y | y ≤ 2 } or $[-2,\infty)$

7.4 – Using substitution to solving a system of linear equations review (see p. 418)

talk to a friend or see me if you need help getting the right answer. Aw 1-15

Use substitution to solve the linear systems of equations for #1-15. (lined paper)

1. $2x+y=2$, $x-y=7$
2. $2x+y=5$, $x-y=4$
3. $3x-y=5$, $x+y=11$
4. $3x-y=2$, $x+4y=31$
5. $2x-3y=-2$, $4x+y=24$
6. $x-2y=12$, $3x-2y=4$
7. $4x+3y=-13$, $x+4y=13$
8. $5x+y=-7$, $2x+5y=11$
9. $4x-y=-8$, $2x+3y=-18$
10. $2x-3y=18$, $x+2y=-26$
11. $3x+y=1$, $15x+7y=-17$
12. $x-y=1$, $5x-4y=12$
13. $3x+y=2$, $x+y=3$
14. $2x-y=3$, $\frac{1}{2}x-y=-3$
15. $\frac{1}{3}x+y=1$, $2x+3y=6$

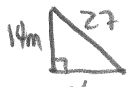
Review: ch 3, 6 (and some algebra, geometry and Pythagoras review just for fun)

16. Simplify: $(x+2)(3x-4)+(2x+1)(x-2)$ $3x^2-4x+6x-8+2x^2-4x+x-2$ $= 5x^2-x-10$

17. Given $x=3$. Find the value of k in $\frac{x+k}{2}+1=8$. $\frac{3+k}{2}+1=8 \Rightarrow 3+k+2=16$, $5+k=16$, $k=11$

18. The circumference of a circle is 50 cm. Find its area to the nearest tenth. ($C = 2\pi r$; $A = \pi r^2$) $50=2\pi r$, $r=\frac{50}{2\pi}$, $r=7.9577$, $A=\pi(7.9577)^2$, $A=198.9\,cm^2$

19. The school flagpole is 14 m high. Using trigonometry (coming soon in ch 2!), a student finds the distance from the top of the pole to where she is standing (the hypotenuse) to be 27 m. Find how far the student is away from the base of flagpole to the nearest meter. (draw the triangle)



$14^2+x^2=27^2$, $x^2=27^2-14^2$, $x^2=\sqrt{533}$, $x=23$ m

20. Find the slope-intercept form of the equation of the line that passes through the point (4, 1) and has a slope of -5. $y-y_1=m(x-x_1)$, $y-1=-5(x-4)$, $y-1=-5x+20$, $y=-5x+21$

Answers:

1. (3, -4)
2. (3, -1)
3. (4, 7)
4. (3, 7)
5. (5, 4)
6. (-4, -8)
7. (-7, 5)
8. (-2, 3)
9. (-3, -4)
10. (-6, -10)
11. (4, -11)
12. (8, 7)
13. $\left(-\frac{1}{2}, \frac{7}{2}\right)$
14. (4, 5)
15. (3, 0)
16. $5x^2-x-10$
17. $k=11$
18. $198.9\,cm^2$
19. 23 m
20. $y=-5x+21$

7.4-7.6 – Solving systems of linear equations review (see p.

7.5 Use the elimination method to solve the linear systems of equations for #1-9. (see p. 430) – lined paper

1. $2x+y=7$, $3x-y=8$
2. $x+3y=15$, $x-y=-5$
3. $5x+2y=-2$, $5x+y=-6$
4. $x+3y=-8$, $4x+2y=-2$
5. $2x-y=0$, $7x+3y=13$
6. $2x-y=-1$, $5x-3y=-5$
7. $2x+5y=3$, $3x+2y=10$
8. $2x-3y=-12$, $7x+4y=-13$
9. $2x-9y=10$, $5x-4y=-12$

7.4 Use the substitution method to solve the linear systems of equations for #10-12. (see p. 418) – lined paper

10. $6x-y=11$, $3x+2y=23$
11. $x+8y=3$, $3x-5y=-20$
12. $\frac{1}{2}x-y=5$, $3x+2y=30$

7.2 Use the graphing method to solve the linear systems of equations for #13-15. (see p. 405) – graph paper

13. $2x+3y=12$, $x-y=1$
14. $x-2y=8$, $4x+2y=2$
15. $\frac{1}{2}x+4y=2$, $x+y=4$

7.6 For #16-18, determine the slope and y-intercept of each line. State the number of solutions for each system and explain why the slope and y-intercept values are helpful. (see p. 444) – lined paper

16. $x+y=-3$, $-2x+y=3$ — $y=-x-3$, $y=2x+3$
17. $-4x+2y=8$, $-2x+y=-2$ — $y=2x+4$, $y=2x-2$
18. $2x+y=-1$, $4x+2y=-2$ — $y=-2x-1$, $y=-2x-1$

Review ch 4 and 5

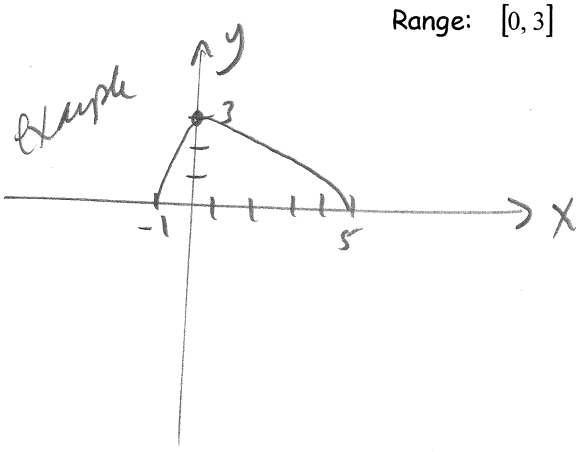
19. Write each mixed radical as an entire radical.

a) $5\sqrt{3}$ — $\sqrt{5^2}\cdot\sqrt{3}$, $\sqrt{25\cdot 3}$, $\sqrt{75}$

b) $4\sqrt[3]{2}$ — $\sqrt[3]{4^3\cdot 2}$, $\sqrt[3]{64\cdot 2}$, $\sqrt[3]{128}$

c) $2\sqrt[5]{2}$ — $\sqrt[5]{25}\ \sqrt[5]{2}$, $\sqrt[5]{32\cdot 2}$, $\sqrt[5]{64}$

20. Sketch a graph of a function that has the following: Domain: $[-1, 5]$ Range: $[0, 3]$



Example

If not sure of your answer, show teacher!

Answers 7.4 – 7.6 review

Talk to a friend or see me if you need help getting right answers for 1–15

1.	(3, 1)	2.	(0, 5)	3.	(-2, 4)
4.	(1, -3)	5.	(1, 2)	6.	(2, 5)
7.	(4, -1)	8.	(-3, 2)	9.	(-4, -2)
10.	(3, 7)	11.	(-5, 1)	12.	(10, 0)
13.	(3, 2)	14.	(2, -3)	15.	(4, 0)

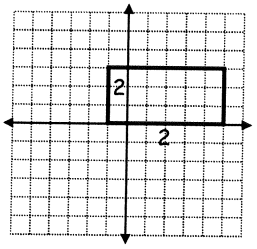
16. Line 1: $m = -1 \quad b = -3$
Line 2: $m = 2 \quad b = 3$
Different slopes so the lines intersect at one point for exactly one solution.

Answers continued:

17. Line 1: $m = 2 \quad b = 4$
Line 2: $m = 2 \quad b = -2$
The same slope so the lines are parallel. With different y-intercepts, the lines do not intersect. There is no solution.

18. Line 1: $m = -2 \quad b = -1$
Line 2: $m = -2 \quad b = -1$
The same slope so the lines are parallel. With the same y-intercept, the lines coincide. There are infinite solutions.

19. a) $\sqrt{75}$ b) $\sqrt[3]{128}$ c) $\sqrt[5]{64}$

20. 

Any function that appears inside the boundaries of the box that has no repeated x-values satisfying the conditions, domain $[-1, 5]$ and range $[0, 3]$.